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Two new prepodesmine millipeds, genus *Callistocilla*, from Tanzania (Polydesmida: Chelodesmidae)

By Richard L. Hoffman

ABSTRACT

The disjunct prepodesmine genus *Callistocilla,* heretofore monobasic, and its geographic range are enlarged by the descriptions of two Tanzanian species: *C. cingulata* (Usambara Mountains) and *C. dolorotrix* (Udzungwa Mountains).

Biological exploration of Tanzania during the past three decades has produced large numbers of undescribed millipeds, the majority of them in autochthonius families such as Gomphodesmidae, Oxydesmidae, and Odontopygidae. Native species of the amphiatlantic taxon Chelodesmidae are only rarely captured, but are of exceptional interest because they represent the surviving remnants of a rainforest fauna that once extended across tropical Africa, and is now fragmented by the origin of extensive savannah regions in the late Tertiary.

These African chelodesmids belong in the subfamily Prepodesminae, a very large and diverse group of forest dwelling animals that fairly swarm in that part of the continent between Cape Verde and the central African rift valley lakes. Of the three east African genera, isolated in rainforest enclaves, two (*Tanzaniella, Morogorius*) are not greatly dissimilar to related taxa occurring in the Lake Region and westward. The third, subject of this notice, cannot be confidently associated with any known genus elsewhere on the continent. The discovery of two undescribed species establishes a considerable enlargement of the generic range, but provides no further insights into the affinities or origin of the group.

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CHELODESMIDAE

Prepodesminae

Although classification of the Neotropical components of the family has been considerably developed – including the recognition of 23 tribal groups – during the past several decades, similar progress cannot be asserted for the African fauna which in my 1980 classification was credited with 33 genera listed alphabetically. Some obvious tribal level groupings are evident, but a long time may elapse before a satisfactory phylogeny can be achieved, following of a lot of basic alpha taxonomy. While *Callistocilla* clearly merits placement in a monobasic tribe or subfamily, formalization of this status is deferred pending a somewhat better knowledge of prepodesmines collectively.

Genus ***Callistocilla*** Hoffman

Callistocilla Hoffman, 1977, Rev. Zool. afr., 91: 70. Proposed with a new species.

Type species: *C. beatrix* Hoffman, by monotypy and original designation.

REMARKS: The original description of this genus included a discussion of its singular characters and speculation on possible relationships. Nothing I have learned about chelodesmids in the ensuing years provides any further insights.

The three species treated here are so superficially similar that extended descriptions of peripheral structure are deemed unnecessary and only the salient differences are mentioned and illustrated: the interested reader is referred to my 1977 paper for further details. As only three species are known, a traditional dichotomous key is likewise omitted. Gonopods are illustrated, and specific features emphasized under the individual diagnoses.

The occurrence of ozopores in the normal sequence in one species is apparently a character not unusual in highly derived species. Parallel cases of intrageneric variation in pore expression are noted for the genera *Iringius*, *Fontariopsis*, and *Heptadesmus* (Oxydesmidae) in the East African fauna, *Stenodesmus* (Xystodesmidae) in Mexico, *Biporodesmus* (Chelodesmidae) in northern South America, and *Eurydesmus* (Chelodesmidae) in Brazil.

DISTRIBUTION: Extreme southeastern Kenya, south and west across Tanzania as far as the Udzungwa Mountains, Iringa Region.

Callistocilla beatrix Hoffman

Figs. 6-8

Callistocilla beatrix Hoffman, 1977, Rev. Zool. afr., 91: 73, figs. 1-6. Male holotype (ZMUC) from Tiwi, 20 km southwest of Mombasa, Kenya, 18 May 1968, A. Schiøtz leg.

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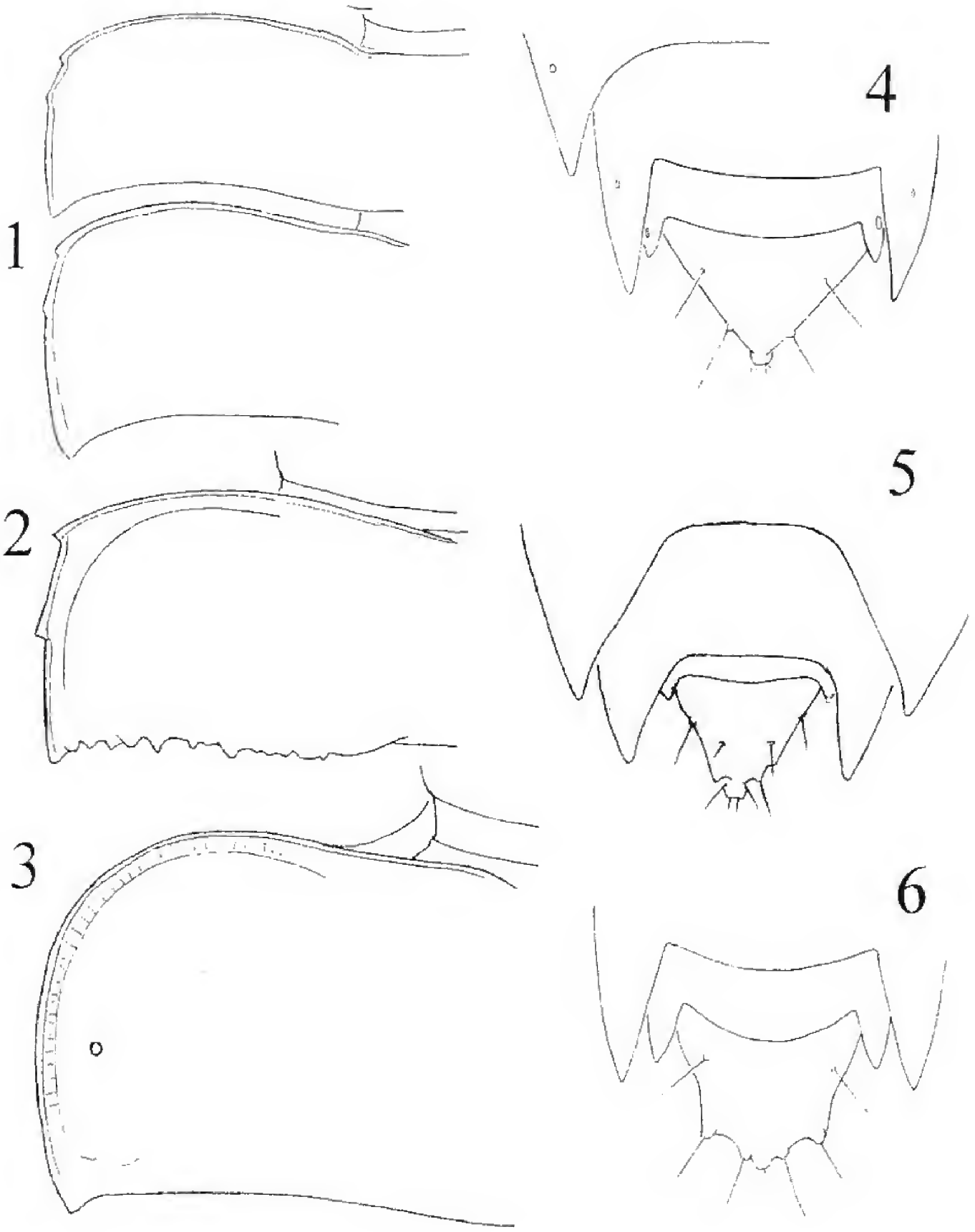

Figs. 1-6. Structural details, *Callistocilla* species. Fig. 1. *C. cingulata*, left paranota of segments 3 and 4. Fig. 2. *C. cingulata*, left paranotum of 10th segment showing armature of edges. Fig. 3. *C. dolorotrix*, left paranotum of 9th segment. Fig. 4. *C. dolorotrix*, segments 18-20, showing ozopores and triangular profile of epiproct. Fig. 5. *C. beatrix*, segments 18-20. Fig. 6. *C. cingulata*, segments 18-20, showing broadened epiproct. Figures 1-3 drawn at same scale to reflect larger size of *cingulata*. Figures 4-5 drawn to same scale, Figure 6 is enlarged about 50%.

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Callistocilla cingulata, new species
Figs. 1-2, 6, 9, 10

MATERIAL: Male holotype (VMNH) from Kwangumi Forest Reserve [38° 44' E, 4°57' S], Muheza District, Tanzania, 31 October 1996, "Frontier Tanzania" group, leg.; two male and two female paratypes from Amani-Sigi Forest Reserve {39.39E, 5.07 S], Muheza District, Tanzania, 6 April 1999, "Frontier Tanzania" group leg.

DIAGNOSIS: Posterior corners of all paranota acutely produced, lateral edge with typically two denticles, posterior edge with several to many dentations (Fig. 4). Epiproct notably broadened (Fig. 5). In gonopod characters, this species is readily distinguished by the prominent development of a cingulum just beyond midlength of the telopodite, most evident in lateral aspect (Fig. 10), and the slender, acuminate form of the prefemoral process. Solenomere long, slender, recurved laterad as in *C. beatrix*; parasolenomere a simple lanceolate thin lamina.

NAME: Latin, provided with a cingulum (joint, constriction), referring to this modification of the gonotelopodite.

HOLOTYPE: Adult male, fragmented into several pieces, reconstructed length ca. 18 mm, maximum width 3.8 mm, thus notably smaller than *beatrix*. Coloration altered by preservation, at present light brown middorsally, paranota almost clear testaceous; legs and antennae nearly white, probably yellow in life.

Peripheral characters similar to those of *beatrix*, but posterior corners of paranota acute on all segments including collum (Fig. 1), with small denticle on anterior curvature, posterior edge finely serrate, on midbody segments provided with several large acute dentations (Fig. 2). Paramedian surface of metaterga longitudinally microcostate. Epiproct greatly broadened by enlargement of the subterminal lateral tubercles (Fig. 6).

Gonopods (Figs. 9 & 10) similar to those of *beatrix* in length and curvature of solenomere, differing in the much smaller and differently shaped parasolenomere and prominent cingulum near midlength of telopodite.

DISTRIBUTION: The type locality is in the southeastern extremity of the East Usambara Mountains, and about 130 km southwest of the locality for *C. beatrix*, to which *cingulatus* shows considerable similarity in gonopod structure.

Callistocilla dolorotrix, new species
Figs. 3, 4, 11, 12.

MATERIAL: Male holotype (VMNH) from the Mwanihana Forest Reserve above Sanje village, 2 January 1981, male paratype, same locality at 3600 ft., 6 January 1981, both K. M. Howell, leg.; also 1 male and 2 female paratypes from the Sanje

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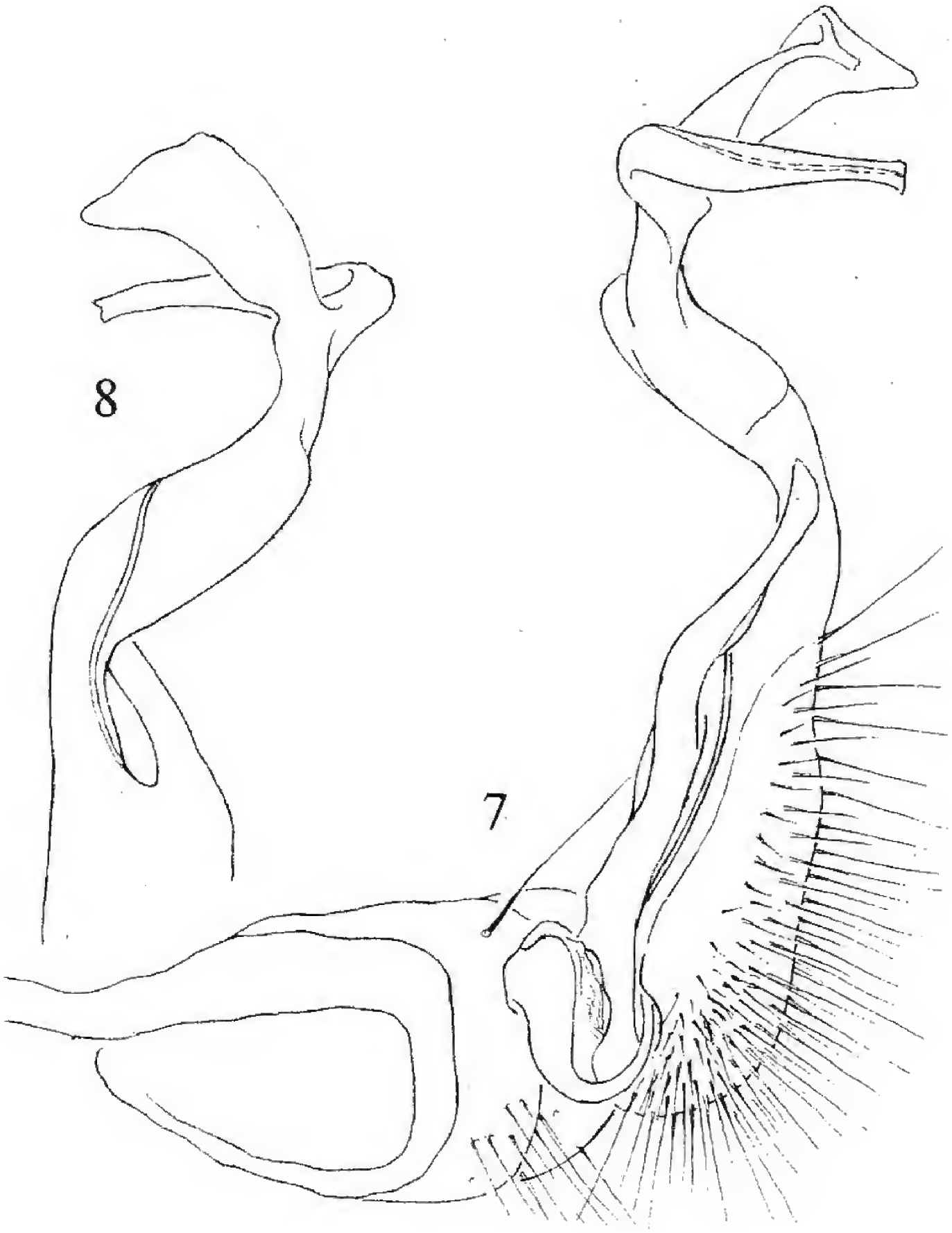

Callistocilla beatrix

Fig. 7. Left gonopod of holotype, mesal aspect. Fig. 8. The same gonopod, lateral aspect.

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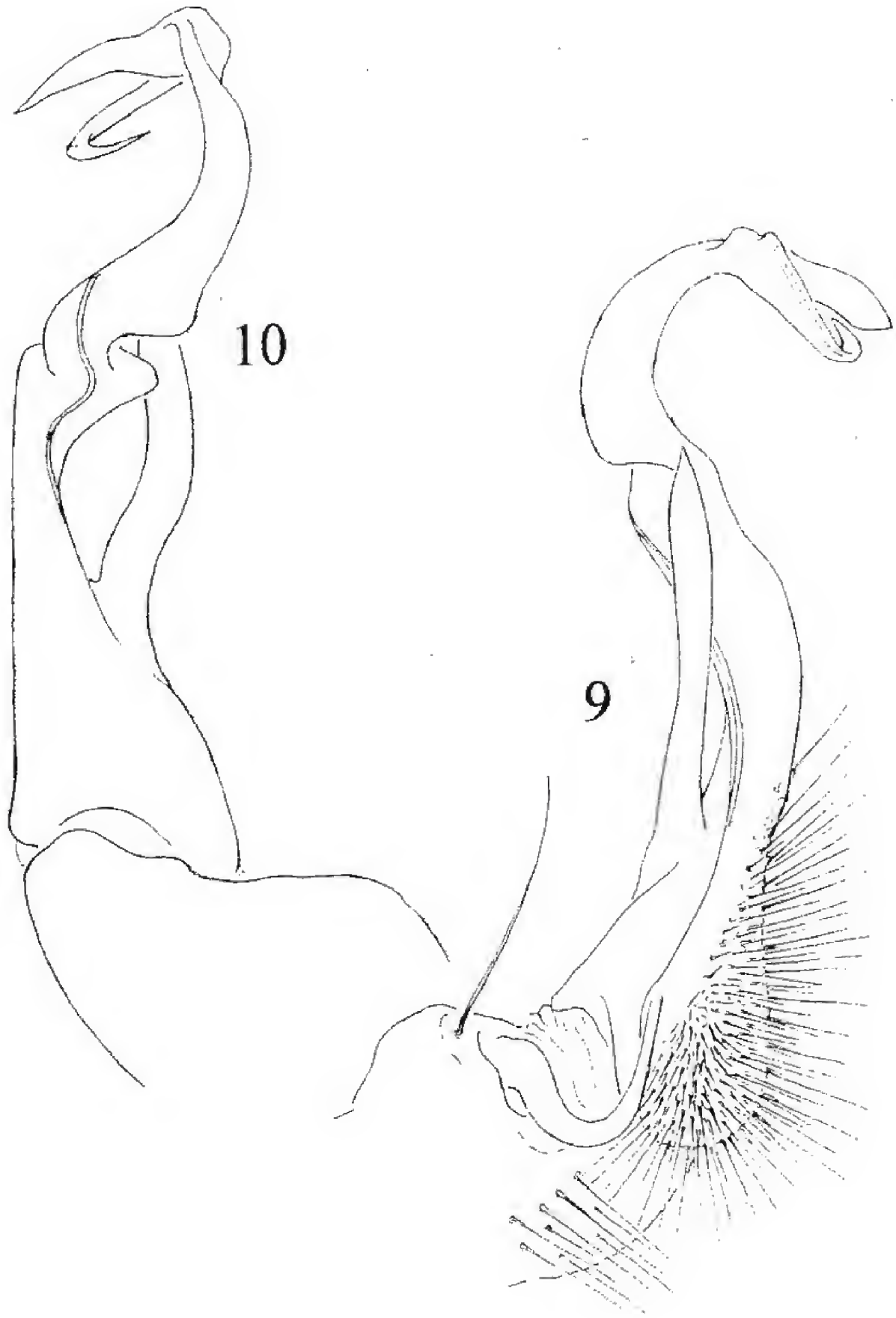

Callistocilla cingulata

Fig. 9. Left gonopod of holotype, mesal aspect. Fig. 10. The same gonopod, lateral aspect.

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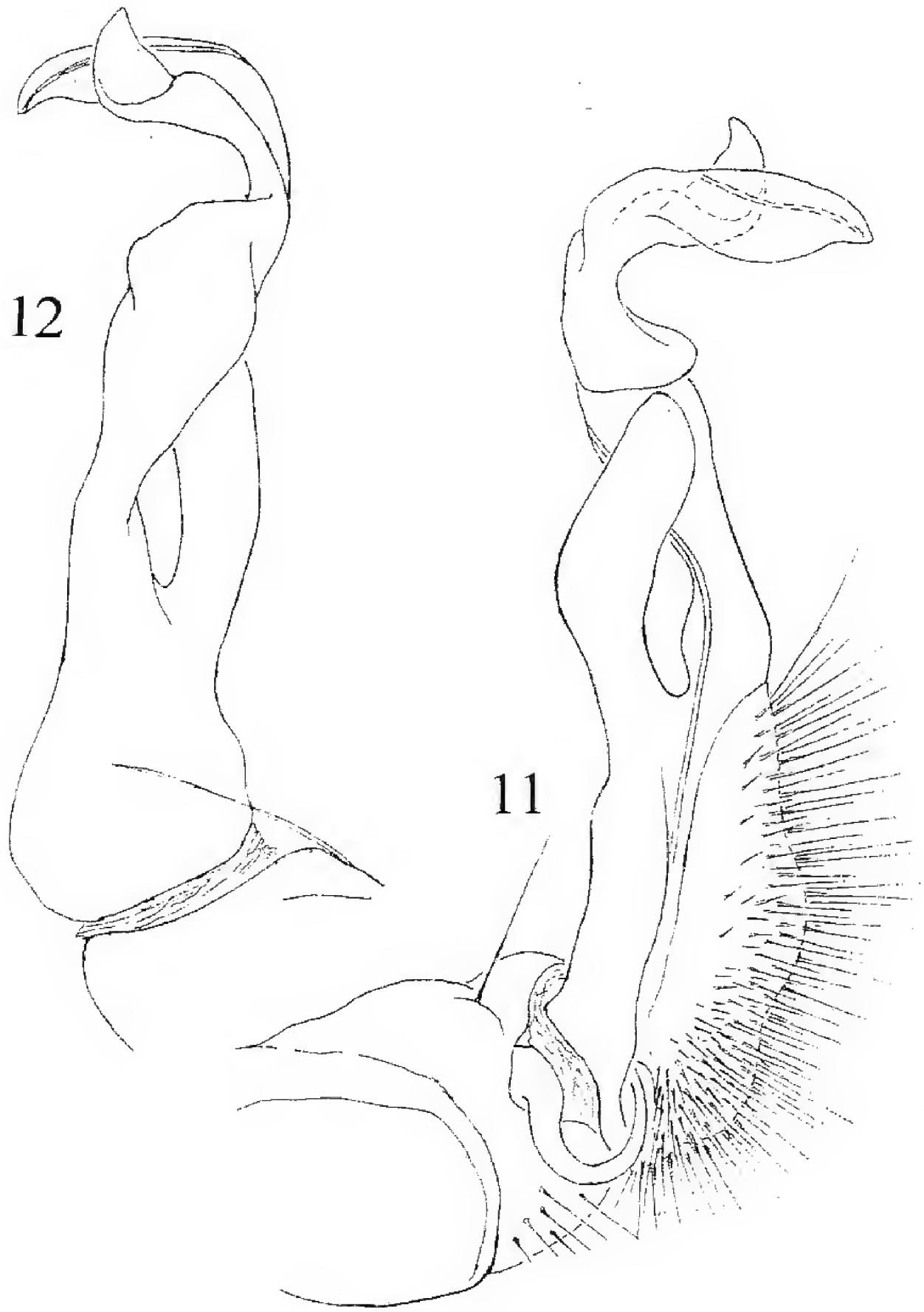

Callistocilla dolorotrix

Fig. 11. Left gonopod of holotype, mesal aspect. Fig. 12. The same gonopod, lateral aspect.

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River valley near Sanje Falls, 3000 ft., Iringa District, Tanzania, 13 November 1979, W. A. Rodgers and K. H. Bulstrode leg.

DIAGNOSIS: This species differs from the other members of the genus by the presence of ozopores on segments 5, 7, 9, 10, 12, 13, 15-19, by the broad, lingulate form of the prefemoral process, and the reflexed distal half of the parasolenomere. Solenomere a thin, lanceolate blade (Fig. 11).

NAME: A neologism derived from the Latin word *dolor*, implying "she who brings sorrow."

HOLOTYPE: Adult male, fragmented, reconstructed length ca. 29 mm, width 5.5 mm, thus substantially larger than the other two species. Coloration altered by preservation, but dorsum light brown, with paranota and a broad transverse metatergal band pale testaceous, almost clear; legs with distinct pinkish tinge, perhaps red in life. Posterior corners of all paranota acute, but less so than in *cingulata*, lateral and posterior edges entirely smooth with no trace of denticles or serrations. Paranota of segments 5, 7, 9, 10, 12, 13, 15-19 with small but distinct ozopores opening flush on surface (no peritreme formed by lateral edge) at about middle of paranotal length, closer to posterior angle on segment 19.

Gonopods distinctive in the subspatulate form of the prefemoral process, and abruptly reflexed distal half of the parasolenomere

DISTRIBUTION: The type locality is located on the east-facing scarp of the Udzungwa Mountains, which are invested in perhaps the most extensive montane forest remaining in Tanzania. The discovery of a species of *Callistocilla* in these mountains endows the generic range with a north-south extent of 500 km, and implies that additional species may be expected from other mountains, such as the Ulugurus, lying within its limits.

Callistocilla, cf. *dolorotrix*

MATERIAL: Female, from the Pugu Forest Reserve, Kisarawe District, Tanzania, 21 November 1982, K. M. Howell leg.

This specimen agrees very closely in peripheral characters (ozopores, shape of paranota, profile of epiproct, tergal texture) with specimens of *dolorotrix* from the type locality and is very likely either that species or a very closely related form. The Pugu Forest (ca. 16 km west of Dar es Salaam) is separated from the Udzungwa Mountains by about 260 km, most of that distance in lowland savannah or scrub forest. Nonetheless a parallel case exists in the milliped family Oxydesmidae. The species *Iringius rossi* is known from the nominate race at the northern end of the Udzungwas and a subspecies *I. r. kisarawensis* described from Pugu. Given such a distributional pattern, one would be justified to suspect that both of these millipeds may be discovered in the southernmost Uluguru Mountains.

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Professor Howell's field notes for the Pugu specimen state "In life a delicate pink; extremely fast moving!"

It thus seems very likely that even recently-preserved material may give a completely false perception of the actual coloration of species of *Callistocilla*.

ACKNOWLEDGEMENT

Our knowledge of these interesting new prepodesmines was gained through the kindness of Prof. K. M. Howell (University of Dar es Salaam) in placing all of the specimens in my hands for study.

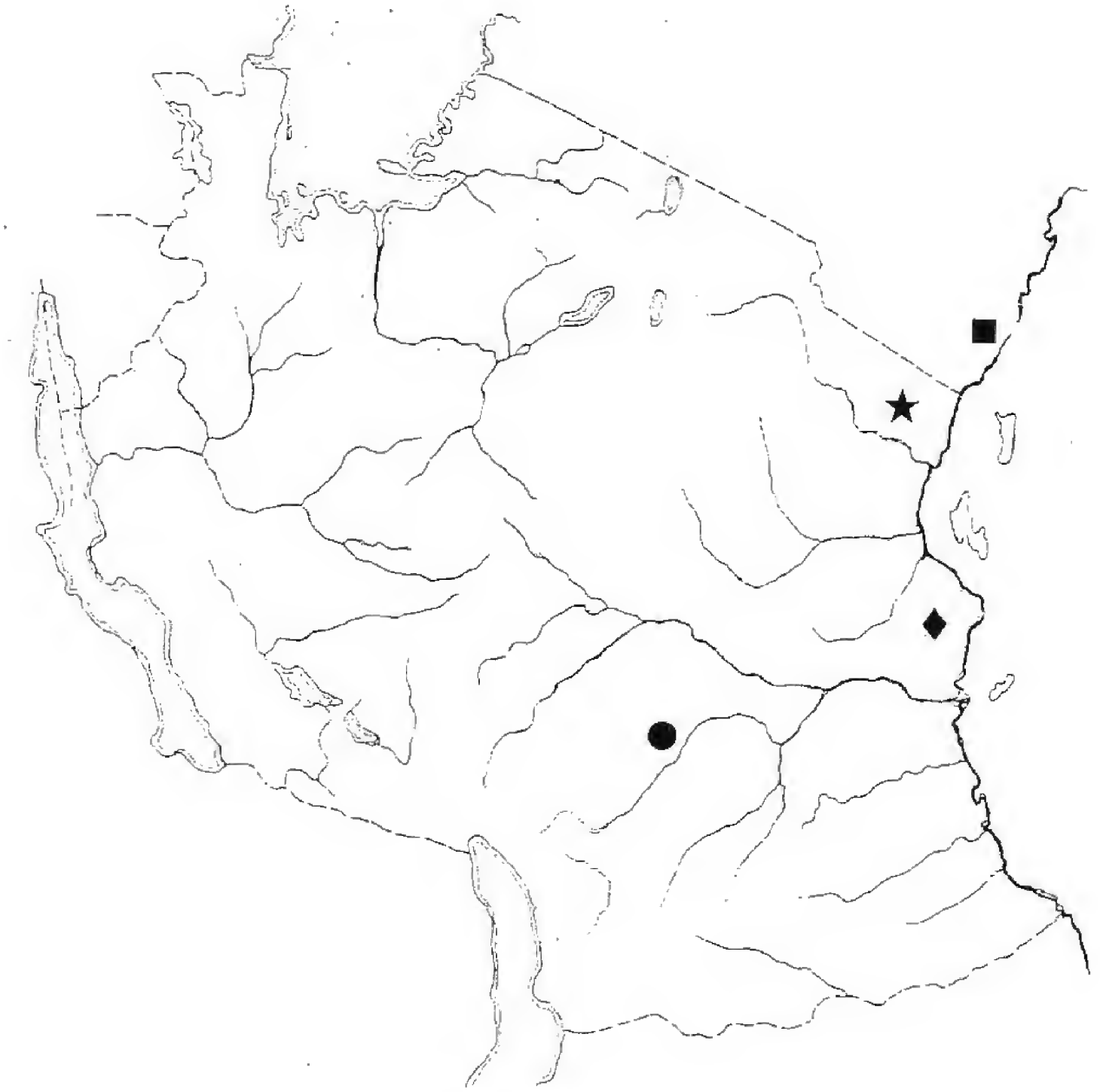

Fig. 13. Distribution of *Callistocilla* in Tanzania and Kenya. ■ *C. beatrix;* ★ *C. cingulata;* ●, *C. dolorotrix;* ◆, unidentified species, Pugu Forest Reserve.

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Address of the author:

Dr. Richard L. Hoffman
Virginia Museum of Natural History
Martinsville, Virginia 24112

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